

in this case were discussed. During the interview, arguments substantially as indicated in this response were discussed. While no agreement was reached, the Examiner indicated that the presented arguments would be fully considered upon filing of a formal response. Specifically, Examiner Addison indicated that she would consider and respond to the arguments described below that *In re Aller* is inapplicable in this case because a results effective variable is not disclosed in any of the prior art.

Turning now to the merits, Applicants' invention is directed to a permanent magnet motor and a method of manufacturing such a motor. Conventional permanent magnet motors have been problematic in that they have been unable to achieve an efficient motor having both reduced cogging torque and reduced vibration noise in a single motor design. Applicants' invention is directed to overcoming this problem.

Specifically, Applicants' Claim 1, recites a permanent-magnet motor having a stator, and a rotor facing to inside of the stator across a gap part, and having a rotor core and a permanent magnet provided to the rotor core. The permanent magnet is made so as to have both of a convex part to an inner diameter side and a convex part to an outer diameter side, a focus of magnetic orientation of each magnetic pole of the permanent magnet is located outside of the rotor. Also recited is that the rotor is formed by a rotor core assembly made by multilayering multiple pieces of core laminations, each having plural containing holes for inserting the permanent magnets and the permanent magnets are inserted into the containing holes for inserting the permanent magnets, and a thickness of the rotor core, which separates the permanent magnet and the gap, is made within $\pm 30\%$ of a thickness of the rotor core lamination. As described in Applicants' specification, a permanent magnet having both a convex part to an inner diameter side and a convex part to an outer diameter side, as well as a thickness of the rotor core that separates the permanent magnet and the gap being made

within $\pm 30\%$ of the thickness of the rotor core lamination provides the unexpected result of a highly efficient motor having reduced cogging torque and reduced vibration in a single motor design.¹ These limitations are also recited in Applicants' independent Claims 8 and 9.

In contrast, Applicants' admitted prior art in Figures 9-15 and pages 1-4 of the specification does not disclose a motor structure that includes both the convex inner and outer part of the permanent magnet. Moreover, the admitted prior art does not disclose a thickness of the rotor core that separates the permanent magnet and the gap being made within $\pm 30\%$ of the thickness of the rotor core lamination. In this regard, it is emphasized that the claimed range is with respect to the outer radial portion of the core and not the air gap itself. Finally, as discussed in previous amendments on record and in the March 3, 2003 interview, none of the references on record (Yoshifumi, Tanimoto et al and Denk teach or suggest the combination of a convex part to an inner diameter side and a convex part to an outer diameter side, as well as a thickness of the rotor core that separates the permanent magnet and the gap being made within $\pm 30\%$ of a thickness of the rotor core lamination.

In response to the position taken in the outstanding Official Action that the claimed range of thickness of the rotor core that separates the permanent magnet and the gap is an optimization of workable ranges, Applicants note that it is settled law that a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977)² It is Applicants' position that the Official Action does not

¹See Applicants' specification at page 8, lines 6-13; page 8, line 25 - page 9, line 5; page 10, lines 1-3.

² See MPEP ' 2144.05 II B.

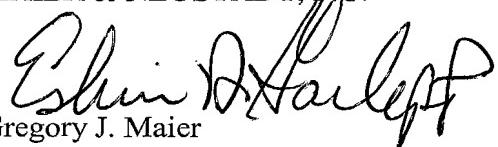
produce any evidence or technical argument that the parameter of thickness of the rotor core that separates the permanent magnet and the gap is effective to produce the result of a highly efficient motor having reduced cogging torque and reduced vibration. Indeed, as discussed in the March 3, 2003 interview the cited references do not discuss any range of thickness or any importance to the thickness of the rotor core at a position between the convex part to the outer diameter and the air gap. That is, the claimed thickness has not been recognized as a result-effective variable and Applicants cannot be said to have optimized a range. Therefore, *In re Aller* is inapplicable to the present case.

For the reasons discussed above, Claims 1, 8 and 9 patentably defines over Applicants' admitted prior art and the references on record. Moreover, as Claims 3-7 depend from Claim 1, these claims also patentably define over the cited references.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application and the present application is believed to be in condition for formal Allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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